

19 July 1961

MEMORANDUM FOR: Director, NPIC

SUBJECT : Report on Kalvar Applications

1. The Naval Ordinance Laboratory at Dahlgreen, Virginia have made an unique application with Kalvar recently. In their computer operations they use IBM punch cards extensively. Storage of these cards is quite bulky and the cards themselves are subject to deterioration from moisture and handling, so a 24X reduction apparatus using ultraviolet light has been made which copies the punch cards onto 16mm Kalvar material. Kalvar, as you know, is on Milar which is sufficiently tough and resistant to moisture, mildew, etc. These reductions are then stored in roll form and searched for retrieval with standard microfilm viewing equipment. Whenever reproductions are required the view selected on the microfilm viewer is enlarged 24 times onto 5 mil Kalvar card stock which is a duplicate of the original card in size and shape. This Milar is then punched on the indicated places where punches occurred on the original. This card is used in the IBM sorting and tabulating machines directly for range finder settings, etc. As you know, the principle of Kalvar allows for dry development and their new emulsions are far superior to those we saw in New Orleans some years back. The only trouble they seem to be having at the moment is getting the proper lenses peaked at the proper spectral sensitivity, that is, in the blue and ultraviolet. I believe that the M-25 modified lens which we used in the electronic rectifier will be capable of handling both resolution and the sensitivity with much greater efficiency than is presently available.

2. This application has a practical use at NPIC where all of our current intelligence products are immediately reduced to punchcard for automation purposes, pre OAKs, etc. This system could be used to create a final storage file of up-to-date information at low storage cubage. In event of disaster, fire, water or explosion and radiation, our present files could be destroyed. Milar with the Kalvar surface is not radiation sensitive, it is water proof and could be duplicated rather rapidly if need be.

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3. Project Walnut - Between DDP, IBM, etc. extensive use of Kalvar materials is being made because of its relative insensitivity to ordinary lighted rooms and for the fact that information can be added to documents at a later date by re-exposure. IBM has set up an IBM/Kalvar plant to conduct developments in the Kalvar IBM card production at San Jose, California. IBM is claiming better than 800 l/mm with some of their experiments while the company is more conservative at 500 plus l/mm.

4. They have developed some new viewing apparatus built especially for the medical research people which allows the use of the "Callier Effect" obtained by obliquely lighting the Kalvar material and thus changing the relative gamma. The results have been quite startling and successful. I believe it would be to our advantage to refresh ourselves on the state of the art of Kalvar especially on their new emulsions which seem to be of much higher quality than the materials we viewed previously.

5. Suggested applications to NPIC - The relatively slow speed of Kalvar plus the fact that it can be re-exposed and developed at a later time might prove to be a real boon in the area of signal-to-noise where multiple integrations of the same scene are desired. The resolution capability and the Callier Effect might well be exploited to a much greater degree for the extremely high resolution 200 l/mm plus and high density materials expected in the future. At the present it is doubtful that any Government facility can reproduce with high fidelity the materials expected in C¹ or by other new programs of operation. It seems to me that we should investigate thoroughly the possibility of doing high acuity printing on Kalvar as a medium to produce intermediate positive transparencies for projection purposes.

6. In summary, I feel that it is justifiable at this time to recommend a very thorough re-evaluation of Kalvar for these purposes in the near future.

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Distribution:

- 1 - D/NPIC
- 1 - OO/NPIC
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